



CELL CULTURE LABORATORY

The cell culture & tissue culture laboratory is dedicated to growth, maintenance, and analysis of mammalian cell lines for basic and applied performance optimization research. Current research capability includes murine muscle fibroblast, human gastrointestinal epithelial, monocytes/macrophage cell lines, and hepatic (murine & human) cell lines. The cell culture lab is a stand-alone 880 ft² laboratory with a dedicated 130 ft² clean room for cell maintenance and passage. In addition to standard centrifugation, refrigeration, mixing/vortexing capabilities, the research in the cell culture lab leverages nearby Combat Feeding Directorate (CFD) microbiology lab capabilities including BioRad PCR cycler, Zeiss laser confocal microscopy, Olympus fluorescent microscopy, UV/Vis plate readers, fluorescent plate readers, gel electrophoresis, fluorometry, and UV/light gel imaging.

Baker SterilGard Biosafety Hood: Class II Type A2 safety hood allows for research on virtually all biological samples. Full stainless steel working area and vent areas, extended Hepa filter life, and improved ergonomics.

ThermoFisher Isotemp CO₂ incubators: Water-jacketed, gravity flow circulation, efficient heating, temperature control to 0.1°C, and entire chamber constructed of stainless steel. Two incubators for maximum flexibility allow for dedicated 5% CO₂ and 10% CO₂ incubation.

ThermoFisher Forma Low Oxygen Incubator: Water-jacketed, gravity flow circulation, efficient heating, temperature control to 0.1°C, and entire chamber constructed of stainless steel. Low oxygen controlled using high quality nitrogen gas from 0-10% O₂. Full range of CO₂ level control.

Nikon TS100 Tissue Microscope w/camera/software: Invert microscope containing Nikon CF160 optical system for longer work surfaces and higher numerical apertures ideal for tissue/cell culture.

UVP UV3 Hepa PCR Workstation: The UV3 is a dedicated work area to eliminate PCR contamination. The equipment brings together UV radiation and complete antimicrobial stainless steel construction to create a dual-attack on contamination in PCR experiments. Contains a four-stage Hepa filtering environment to ensure contamination-free DNA/RNA isolation and preparation.

Nanodrop 2000 Spectrophotometer: Micro-volume UV-Vis spectrophotometer for nucleic acid and protein quantification. Measures purity of DNA, RNA, protein concentrations (2 ng/μL – 15,000 ng/μL dsDNA) without dilution. System is capable of self-calibration and requires no consumables

Shimadzu 2550 UV/Vis Spectrophotometer: Ultra-low stray light, double-blazed grating monochromator allows for high-energy throughput readings of high resolution and accuracy. Allows for spectral analysis of a wide range of samples including organic and inorganic compounds, DNA/RNA, and enzymes. By limiting stray light better than most spectrophotometers, the 2550 can accurately measure highly concentrated samples without the need for dilution. UVProbe software is capable of spectrum, kinetics, or photometric modules allowing for a complete range of data analysis.

Frozen Storage: In addition to standard 0°C, the cell culture lab has capability for -80°C storage as well as -140°C liquid nitrogen cryogenic storage. Cryogenic storage is critical to collect and maintain long term storage of biological sample library.



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TECHNOLOGY DRIVEN. WARFIGHTER FOCUSED.



Electroporation: The BTX T820 electroporation is capable of significant increases in cell conductivity, and thus permeability of cell membranes. Electroporation is a technique that aids in the introduction of substances into mammalian cells, such as transfection of genetic material.

BioTek Flx800 Fluorescent Plate Reader: The microplate reader is capable of top and bottom reading of 6-well to 384-well microplates, and PCR plates. Optional external liquid dispenser allows for ion channel and flash luminescence (ex, luciferase, ATP) assays. Gen5 data analysis software allows for complete computer control as well data presentation and reduction capability.

Tissue Preparation: The cell culture laboratory has capability of tissue/cell sonication via Misonix 3000 sonicator. The Misonix 3000 is stand-alone, fully enclosed cabinet ensuring operator safety while sonicating biological samples. The laboratory also has a Glas-Col tissue homogenizer with multiple mortar & pestle attachment options allowing for a full-range of tissue type (and volume) homogenization.

Combi SV-12 Hybridization Incubator: The hybridization incubator allows for accurate temperature control and mixing capabilities built into one instrument. The SV-12 is capable of rotisserie-type mixing of 50ml, 15ml, or 1.5ml microcentrifuge tubes at temperature. The SV-12 is also capable of storing some mixing equipment allowing for table-type or gyro-mixing at temperature of virtually any size vessel (Erlenmeyer, beaker, media bottle). A Vortemp 56 shaker-incubator is capable of temperature controlled mixing of 6-well to 384-well microplates.

BT4000 ORbi-Shaker: A benchtop laboratory shaker with brushless motor and remote controller unit designed to withstand extreme environments, including incubators up to 100% humidity. The shaker allows for growing suspension cell lines in any incubator condition. Together with low-oxygen incubator, suspension cell lines can be grown in any CO₂/O₂ gas composition.

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